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SYNOPSIS

03/19/2021

Review of "Community Transmission of SARS-CoV-2 at Three Fitness Facilities – Hawaii, June–July 2020" and "COVID-19 Outbreak Among Attendees of an Exercise Facility – Chicago, Illinois, August–September 2020"

Article citations:

Groves LM, Usagawa L, Elm J, Low E, Manuzak A, Quint J, et al. Community transmission of SARS-CoV-2 at three fitness facilities – Hawaii, June–July 2020. MMWR Morb Mortal Wkly Rep. 2021;70(9):316-20. Available from: https://doi.org/10.15585/mmwr.mm7009e1

Lendacki FR, Teran RA, Gretsch S, Fricchione MJ, Kerin JL. COVID-19 outbreak among attendees of an exercise facility – Chicago, Illinois, August–September 2020. MMWR Morb Mortal Wkly Rep. 2021;70(9):321-5. Available from: https://doi.org/10.15585/mmwr.mm7009e2

One-minute summary

- Two outbreaks of Coronavirus Disease 2019 (COVID-19) in fitness facilities (one in Hawaii, the other in Chicago) were reported in the March 5, 2021 issue of the Morbidity Mortality Weekly Report.
- The **Hawaii outbreak occurred at three facilities** in late June and early July 2020, **when community COVID-19 transmission was low** (averaging 2–3 cases/100,000 persons a day). The index case was a fitness instructor (A) and 21 cases were generated, including one who was also a fitness instructor (B).
    - Both instructors A and B taught classes (yoga and cycling for instructor A; personal training and kickboxing for instructor B) up to the day of symptom-onset and the **aggregated attack rate for both instructors was highest at 20/21 exposed (95%) <1 day before symptom-onset** (BOS).
    - **Masks** were **not generally used**, and physical distancing was variably performed.
    - The authors postulated that **aerosols released by instructor A when shouting instructions** during the cycling sessions might have contributed to transmission. This was likely facilitated by **extended contact without mask use in poorly ventilated rooms despite physical distance of ≥ 6 feet** between the instructor and participants, and between cycling stations.
- The Chicago outbreak occurred at a facility where 91 individuals attended indoor high-intensity exercise classes using weights and mats held between August 24 and September 1, 2020. Among

the 81 attendees with test or interview data available, 55 cases (49 confirmed and 6 suspected) were identified.

- The Chicago Department of Public Health attributed the outbreak to the **large number of symptomatic or infectious attendees** (and possibly the **infrequent use of masks**) in class.
    - 43 individuals attended an exercise class during their estimated period of communicability, including 22 who attended despite experiencing symptoms and 3 who attended on the day of, or after, getting their positive test results.
    - Infrequent mask wearing, lack of physical distancing and participation in other social activities were reported more by cases than non-cases.
- The outbreak highlighted the **importance of quarantine while awaiting COVID-19 test results** and **avoidance of gatherings while individuals may be unknowingly infectious.**

Additional information

The Hawaii outbreak

- Instructor A reported onset of fatigue on the evening of June 29 with chills, body aches, headache and respiratory symptoms beginning the following day. Instructor A's COVID-19 test result was identified as positive on July 1. The number of cases (**attack rates**) among participants in the instructor's classes were:
    - 0 (**0%**) out of 27 participants exposed at a **1-hour yoga class** on June 27 (**60 hours BOS**). **Only instructor A wore a mask**.
    - 0 (**0%**) out of 4 participants exposed at a **1-hour spin class** only on June 28 (**38 hours BOS**). **No one was masked** and three large floor **fans directed at the participants** were on while **doors and windows were closed**. There was **≥ 6 feet distance** between instructor A and participants, and between cycling stations.
    - 10 (**100%**) out of 10 participants exposed at a **1-hour spin class** on June 29 (**4 hours BOS**) with the same setup as the day before. Six of these participants were also exposed on the June 28 class. **No one was masked.**
- Instructor B reported onset of body aches and sore throat on the evening of July 2. His COVID-19 test result was identified as positive on July 4 and he was later admitted to the hospital intensive care unit. The number of cases (attack rates) among participants in his classes were:
    - 0 (**0%**) out of 3 participants exposed at **1-hour personal training** classes on June 30 (**≥2 days BOS**). Everyone was masked but **only one caregiver maintained physical distance**.
    - 0 (**0%**) out of 3 participants exposed at **1-hour kickboxing classes** on June 30 (**≥2 days BOS); no one was masked** and **only one caregiver maintained physical distance**.
    - 1 (**25%**) out of 4 participants exposed at a **personal training class** on July 1 (**36 hours BOS**); **no one was masked**.
    - 1 (**50%**) out of 2 participants exposed at a **personal training class** on July 2 (**12 hours BOS**); **no one was masked**.
    - 9 (**100%**) out of 9 participants exposed at 3 **kickboxing classes and 1 personal training session** on July 2 (**<12 hours BOS**); instructor B was unmasked; **two participants were masked and both were infected**. Four of the nine participants (including one of the masked participants) were also exposed on the June 30 classes.
- Limitations to the data reported by the authors include:

- **Effects of cumulative exposure** (many participants attended multiple classes) were not taken into consideration as attack rates were calculated using the most recent exposure day.
- The number of COVID-19 cases might have been underestimated as many asymptomatic participants were not tested and testing might have been refused by some who were symptomatic.

The Chicago outbreak

- The median age of the 55 cases was 42 years (range: 29-55). No employee cases were identified.
- Symptom and outcome data were available for 47/55 cases:
  - 2 had visited the emergency department and 1 was hospitalized for 8 days without use of oxygen support. No one was reported to have died associated with the outbreak.
- Preventive measures in place during the outbreak:
  - reduced class capacity at ≤25% (10 to 15 persons)
  - mask use on entry but may be removed during exercise
  - temperature checks and symptom screening on entry
  - physical distancing of ≥ 6 feet
  - patrons bringing their own mats and weights
- A case-control analysis was performed on the behavioural data available for 42 attendees. In-class behaviours reported more frequently by confirmed cases (n=32) than test-negative attendees (n=10) include:
  - Wearing mask for ≤60% of class time: 28 (87.5%) vs. 6 (60%); odds ratio (OR) = 4.5; 95% confidence interval (CI) = 0.6-32.2; P = 0.15.
  - Wearing mask for ≤60% of class time as observed by others: 29 (90.6%) vs. 7 (70%); OR = 3.9; 95% CI = 0.4-36.6; P = 0.27.
  - Practising physical distancing for ≤60% of class time: 2 (6.2%) vs. 1 (10.0%); OR = 0.6; 95% CI = 0.0-39.3; P = 1.00.
- Although ventilation was not assessed, the facility was not designed for physical activities and ventilation may have played a role in transmission.
- The authors noted the temporal distribution of the cases and suggested a point source of transmission. However, no index case was identified; testing or interview data were missing from 10/91 attendees; at least 25% of cases with behavioural data had social contact outside of the classes; and a large number of confirmed or symptomatic attendees attended a class during their period of communicability.
- Limitations to the data reported by the authors include:
  - **Incomplete data** on symptoms, test results, in-class behaviour and the small cohort size limited accurate estimate of case counts and analysis of risk factors that might have contributed to the outbreak.
  - **Self-reported data** might be subject to recall and social desirability biases.
  - **Exposure outside of the exercise classes could not be ruled out** as genetic sequencing was not performed.

Common to both outbreaks

- Authors of both outbreak reports proposed the following measures to minimize the risk of COVID-19 transmission in fitness facilities:

- Every employee and patron should wear a mask, even during high-intensity activities when ≥6 feet apart.
- Ventilation should be improved by maximizing fresh air intake and optimizing heating, ventilation and air conditioning system filter efficiency; supplementary air filtration by portable units should be used as required; placement of portable ventilation units should be strategic to avoid direct blowing from one occupant to another.
- Consistent and correct mask use, and physical distancing should be enforced; physical contact, class size and crowded spaces should be limited.
- Infected employees and patrons should be reminded to stay home and away from others for ≥10 days after symptom-onset or after testing positive if asymptomatic, and to observe quarantine guidance after close contact with a person with COVID-19 while awaiting test results.
- Opportunities for hand hygiene should be increased.
- Moving exercise activities outdoors or conducting them virtually should be considered.

PHO reviewer's comments

- Definitive evidence on the source(s) and routes of transmission of the two outbreaks is lacking given the uncertainty around local incidence of COVID-19 infections, constraints in testing availability, the lack of information on exposure beyond the fitness facilities (or noted social contact), and the extent to which environmental surfaces or individual behaviours (e.g., inadvertent or brief contact or close proximity) might have contributed to the transmission.
- For the spin classes of the Hawaii outbreak, airborne or long-range aerosol transmission likely played a higher role in this cluster than what is typically observed in the community, owing to a confluence of characteristics present, including no mask use, variable adherence to physical distancing, physical exertion/shouting, and prolonged contact indoors where ventilation was poor or suboptimal.
- Notwithstanding the uncertainties and the limitations mentioned in the outbreak reports, risk mitigation strategies which have been widely implemented with consistent evidence for efficacy were recommended as precautionary measures to safeguard public health and safety.
- Ventilation is a supportive measure to reduce the risk of COVID-19 transmission as the authors suggest, and inadequate ventilation has been associated with transmission. However, it is important to note that improvements in ventilation will not eliminate transmission risk, such as in situations of close contact and intense aerosol generation by infectious individuals.
- While wearing masks is an important public health measure to reduce COVID-19 transmission, wearing a mask in a fitness setting is likely less tolerable than regular mask use in an indoor setting. Further, effectiveness of masks as source control to contain aerosols released during forceful breathing requires further study as more aerosols may be produced, and the secure fit of the mask may be undermined by body movement. Regardless, in this context, any mask use is likely to reduce risk compared to no mask.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of "Community transmission of SARS-CoV-2 at three fitness facilities – Hawaii, June–July 2020" and "COVID-19 outbreak among attendees of an exercise facility – Chicago, Illinois, August–September 2020". Toronto, ON: Queen's Printer for Ontario; 2021.

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